Advances
2024; 5(1): 1-4
http://www.sciencepublishinggroup.com/j/advances
doi: 10.11648/j.advances.20240501.11
ISSN: 2994-7200 (Online)

Constraints and Opportunity of *Teff* Production in the Case of Assosa Woreda, Benishangul Gumuz Regional State, Ethiopia

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To cite this article:

Alemayehu Keba Beyene, Sura Degefu Tadessa. (2024). Constraints and Opportunity of Teff Production in the Case of Assosa Woreda, Benishangul Gumuz Regional State, Ethiopia. *Advances*, *5*(1), 1-4. https://doi.org/10.11648/j.advances.20240501.11

Received: December 11, 2023; **Accepted**: December 28, 2023; **Published**: January 11, 2024

Abstract: *Teff*, a vital cereal in Ethiopia's economy, is consumed locally and plays a significant role. It supports the livelihoods of numerous farmers, creates job opportunities, and generates foreign currency. The Assosa woreda, situated in the western part of Ethiopia's Benishangul gumuz regional state, has the potential for cereal production, specifically maize, teff, and sorghum. However, currently, farmers in the woreda are not benefiting, and the production and productivity of these cereals are declining due to various limitations. Hence, the objective of this study was to assess the restrictions and possibilities for teff production in the woreda. Data was collected through a random sampling method, incorporating both quantitative and qualitative data types. A total of 194 *teff*-producing households from four kebeles (Amba 1, Amba 10, Ura, Selga 24, and Afasizm) were surveyed, and qualitative data was obtained through Focus Group Discussions and Key Informant Interviews. The findings revealed that disease, insect pests, lodging, and weeds were the primary constraints affecting teff production and productivity in Assosa woreda. The study also found that a favorable condition, such as the rising demand for teff crops, the suitability of land for teff production particularly natural endowment and government policies that emphasize agricultural transformation and infrastructure development, especially in rural areas, all encourage farmers to produce *teff* in the study area. As a result, policymakers should encourage researchers to develop teff varieties that are resistant to diseases and insects, strengthen extension services, and enhance the knowledge and skills of smallholder farmers to improve their livelihoods and contribute to the overall economy.

Keywords: Assosa, Cereal, Production, *Teff*, Ethiopia

1. Introduction

For many African nations, increased agricultural productivity is a vital factor in their economic growth. In fact, the majority of sub-Saharan African (SSA) countries are dealing with persistent and prolonged food insecurity and poverty due to growing populations and frequently minimal development in agricultural output, leaving a large social and economic problem [7].

Highland Ethiopia, renowned for its dense population, has a past of encountering Malthusian catastrophes and adopting Boserupian agricultural intensification [5]. The agricultural industry in Ethiopia plays a pivotal role in the nation's economy, where crop cultivation is the primary occupation for farmers [14]. The majority of Ethiopia's population is employed in agriculture, which also accounts for 81.5% of the nation's export revenue and 32.5% of the GDP [13]. However, Ethiopia's agricultural production is currently under decline, despite the country's long history of resilience [15]. Numerous constraints affect the sector's Production and productivity. Among the primary barriers to the agricultural sector's development are drought, the depletion of natural resources, poor technology, a lack of institutional support, pests, disease, and limitations on market development [9, 16].

Teff is one of the main staple foods of Ethiopia. In terms of cultivation area and output value, it is the most significant crop [10]. Currently, Ethiopia is the world's biggest producer of teff, the only nation to have made the grain a staple crop,

and it produces over 90% of the teff consumed worldwide [1]. With regard to cereal crops, the nation only has a comparative trade advantage with teff. According to [3], Teff is grown by 6.5 million smallholder farmers, and it is essential to the livelihoods of many Ethiopians. Tef (Eragrostis Tef), an ancient grain, also holds great significance in Ethiopian cuisine and tradition. Moreover, its gluten-free properties and rich iron and fiber composition have resulted in a recent surge in global demand [8].

In particular, the main factors that limit crop production include disease, storage pests, a lack of disease-resistant varieties, and low market demand, which discourages farmers from focusing on production [6]. The main constraints faced in maize, wheat, and teff production are crop worms and diseases, price issues, a lack of inputs (such as chemicals, fertilizers, and seeds), inadequate threshing and storage facilities, high post-harvest losses, a shortage of farming oxen, a lack of rural credit, limited education, and a lack of rural feeder roads [2]. Challenges related to crop characteristics, such as small seed size, difficulties in crossing, shattering, and lodging, as well as a lack of focus, problems with mechanization, and a need for capacity building, also exist. Some of these challenges have been resolved to some extent, while others persist [11]. Teff farmers in the study areas face several constraints in production and marketing, including a lack of funds for investment, a shortage of improved teff seeds, inadequate production tools and harvesting methods, limited land availability, and high production costs [4].

The main opportunity in teff production is to raise awareness. Farmers should be given the chance to sell their products in a fair and advantageous market, while also improving the connection between farmers and extension experts. The government can assist farmers by providing mechanized planters. By implementing technologies like climate-smart agriculture (CSA), the limitations of smallholder farming systems can be addressed [12]. The opportunities and market for teff production in the study areas were clearly identified [4]. These opportunities include a high demand for teff in the market, proximity to the market, suitable climate and soil conditions, and strong support and encouragement from the government.

Despite teff being one of the main cereal crops cultivated in the region, the challenges and opportunities related to its production have not yet been recognized. Thus, the aim of this study was to ascertain the constraints and potential benefits of teff production for small-scale farmers in the research area.

2. Methodology

The study was carried out in the Assosa woreda, which is situated in the Benishangul Gumuz regional state's Assosa zone in western Ethiopia. The capital Addis Ababa is 681 kilometers west of the Assosa Woreda. Four particular kebeles in Assosa Woreda, Assosa Zone, Western Ethiopia—Amba 1, Amba 10, Ura, Selga 24, and Afasizm—were the subject of the study. We specifically chose these kebeles based on their potential to produce mangos. A structured questionnaire was used to gather primary data from 194 households. Key informants (KII) and focus group discussions (FGD) were further methods used to collect qualitative data. Furthermore, secondary data was gathered from a range of publicly available and unpublished sources. Utilizing descriptive statistics, the gathered data was analyzed and presented using tables, graphs, charts, means, percentages, and standard deviations.

3. Results and Discussion

3.1. Characterization of Teff Production in Assosa Woreda

The primary sources of income for farmers in the study areas consist of cereal, pulse and oil, tropical fruits, and livestock. However, cereal, particularly teff, plays a significant role in terms of consumption and land utilization in the woreda. The findings reveal that, on average, farmers possess 2.99 hectares of land, with 0.29 hectares specifically allocated for teff cultivation. The average teff production per hectare amounts to 10.64 quintal. The productivity of teff is generally influenced by various factors, including disease, lodging, soil degradation, unpredictable rain seasons, insect pests, and insufficient post-harvest management (Table 1).

Table 1. *Teff production owned by households.*

Variable	Mean	Std. Dev.	Min	Max
Total owned land area (ha)	2.99	3.54	0.25	30
Teff area owned (ha)	0.29	0.41	0.25	2
Teff production (Quintal)	10.64	1.02	0	35

Source: Survey results, 2019

3.2. Household Composition and Characteristics

Based on the results of the survey results, table 2 below displays that the sample household heads had an average farm experience of 22.56 years, an average age of 47.94, an average distance to the farmers' cooperative of 2.56 minutes, an average distance to the extension office of 4.72 minutes, and an average distance of 18.25 minutes to the local market. Even though the farmers in the area grow teff, the distance to the cooperative, extensionist, and local market presented challenges in enhancing crop productivity in the study area (Please refer to table 2 below).

Table 2. *Household composition and characteristics.*

Variable	Mean	Std. Dev.	Min	Max
Farm experience (year)	22.56	9.63	0	40
Age of the house hold	47.94	15.58	0	85
Distance to farmer cooperative (Minute)	2.56	10.14	0	100
Distance to extension (Minute)	4.72	30.82	0	300
Distance to local market (Minute)	18.25	4.24	1	40

Source: Survey results, 2019

3.3. Constraints for Teff Production

Regarding *Teff* production, farmers in the areas encountered a variety of difficulties. The findings of the study reveal that

diseases, weeds, insect pests, and lodging cause a loss in teff production. Among 194 sampled responders, 74.2% reported that the reason behind their inadequate *teff* production was *teff* disease. Approximately 83% of the participants indicated that weed was the primary obstacle they faced, whereas the remaining 17% stated that weed was not the primary problem. Of the 194 respondents, 78.9% stated that the main factor limiting their *teff* yield was insect pests. The majority of respondents 72.7% stated the spread of weeds was the biggest obstacle they faced when cultivating *teff*, with the remaining 27.3% saying it wasn't the main constraint (Table 3).

Table 3. *The major constraints of teff production.*

Constraints	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
Disease	50	25.8	144	74.2
Weed	33	17	161	83
Insect pests	41	21.1	153	78.9
Lodging	53	27.3	141	72.7

Source: Survey results, 2019

3.4. Opportunities for Teff Production

Opportunity refers to presenting someone with a range of favorable possibilities. The study tried to identify opportunities for *teff* production in the study areas through FGD with selected farmers and key informant interview with woreda agricultural office staff and extension workers at kebele level. In a similar vein, respondents were asked to mention advantageous conditions for *Teff* production in the study areas. Thus, the study narrated and summarized the favorable conditions for *Teff* production in the study area's as follows:

1. Rising demand in the country and global level

The demand for *Teff* crops is rising both domestically and internationally, especially in developed countries. Better farm prices for growers would follow increased demand. The importance of *Teff* has been previously discussed in the literature; it has gained notice because of its extremely appealing nutritional profile and gluten-free nature, which enable it to be used as a suitable replacement for wheat and other cereals in food applications as well as foods for individuals with celiac disease.

2. Land accessibility and suitability for the Teff production

Benishangul Gumuz region is one of the suitable areas for teff production in the country. The majority of respondents had mixed types of land, which indicates that the land's character is neither plain nor steep, according to the results that were given. It is among the opportunities for natural endowment in the area. These opportunities are significant for the growth of grain crops like teff, chickpea and grass pea.

3. Favorable government policy and better extension services

Government policies and initiatives currently in place offer adequate consideration to the transformation of agriculture and the construction of essential infrastructure, including roads, communications, and telecom services, across the nation, with a focus on rural areas. A key component of agricultural development strategies is the provision of extension services to the agricultural sector, as well as assistance and motivation for model farmers. This helps and motivates farmers to participate in the production of *teff*.

4. Conclusion and Recommendation

The study's objective was to learn more about the potential and constraints of teff production in the Assosa woreda of Benishangul Gumuz regions, Ethiopia. As a result, it provides essential, fundamental, and pertinent information about the production of teff. The findings revealed that disease, insect pests, lodging, and weeds were the primary constraints affecting teff production and productivity in Assosa woreda. The study also found that a favorable condition, such as the rising demand for *teff* crops, the suitability of land for *teff* production particularly natural endowment and government policies that emphasize agricultural transformation and infrastructure development, especially in rural areas, all encourage farmers to produce *teff* in the study area.

In order to improve the livelihoods of smallholder farmers, therefore, efforts should be made to close the gaps that have been identified, take advantage of opportunities, seize those opportunities, and make up for the knowledge and skill gaps that smaller farmers lack. As a result, policymakers should encourage researchers to develop *teff* varieties that are resistant to diseases and insects, strengthen extension services, and enhance the knowledge and skills of smallholder farmers to improve their livelihoods and contribute to the overall economy. The recommended actions to accomplish this include training smallholder farmers on disease and pest management in *teff* production, raising output and productivity, and enhancing their knowledge and abilities through developmental development initiatives like the provision of necessary inputs and improved crop varieties, in addition to supporting operating resources and research and development.

Conflicts of Interest

The author declares no conflicts of interest.

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